The Operation and Maintenance (O&M) Data Package

12/01

1. TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

- Safety Precautions
  List personnel hazards and equipment or product safety precautions for all operating conditions.

- Operator Pre start
  Include procedures required to set up and prepare each system for use.

- Startup, Shutdown, and Post shutdown Procedures
  Provide narrative description for each operating procedure including control sequence for each.

- Normal Operations
  Provide narrative description of normal operating procedures. Include control diagrams with data to explain operation and control of systems and specific equipment.

- Emergency Operations
  Include emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include emergency shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portions of systems controlled.

- Operator Service Requirements
  Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and gage reading recording.

- Environmental Conditions
  Include a list of environmental conditions (temperature, humidity, and other relevant data) that are best suited for each product or piece of equipment and describe conditions under which equipment should not be allowed to run.

Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

- Lubrication Data
  Include lubrication data, other than instructions for lubrication in accordance with paragraph titled "Operator Service Requirements":

  a. A table showing recommended lubricants for specific temperature ranges and applications;
  b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities; and
  c. A lubrication schedule showing service interval frequency.

- Preventive Maintenance Plan and Schedule
  Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

Corrective Maintenance (Repair)

Include manufacturer's recommendations on procedures and instructions for correcting problems and making repairs.

- Troubleshooting Guides and Diagnostic Techniques
  Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

- Wiring Diagrams and Control Diagrams
  Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

- Maintenance and Repair Procedures
  Include instructions and list tools required to restore product or equipment to proper condition or operating standards.

- Removal and Replacement Instructions
  Include step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

- Spare Parts and Supply Lists
  Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

- Corrective Maintenance Work-Hours
  Include manufacturer's projection of corrective maintenance work-hours including craft requirements by type of craft. Corrective maintenance that requires participation of the equipment manufacturer shall be identified and tabulated separately.

Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

- Parts Identification
  Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify

parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by: components, assemblies, and subassemblies. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

- Warranty Information
  List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

- Personnel Training Requirements
  Provide information available from the manufacturers to use in training designated personnel to operate and maintain the equipment and systems properly.

- Testing Equipment and Special Tool Information
  Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

- Contractor Information
  Provide a list that includes the name, address, and telephone number of the General Contractor and each subcontractor installing the product or equipment. Include local representatives and service organizations most convenient to the project site. Provide the name, address, and telephone number of the product or equipment manufacturers.

2. SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M Data Packages specified in individual technical sections. The required information for each O&M Data Package is as follows:

Data Package 1

a. Safety precautions
b. Maintenance and repair procedures
c. Warranty information
d. Contractor information
e. Spare parts and supply list

Data Package 2

a. Safety precautions
b. Normal operations
c. Environmental conditions
d. Lubrication data
e. Preventive maintenance plan and schedule
f. Maintenance and repair procedures
g. Removal and replacement instructions
h. Spare parts and supply list
i. Parts identification
j. Warranty information
k. Contractor information

Data Package 3

a. Safety precautions
b. Normal operations
c. Emergency operations
d. Environmental conditions
e. Lubrication data
f. Preventive maintenance plan and schedule
g. Troubleshooting guides and diagnostic techniques
h. Wiring diagrams and control diagrams
i. Maintenance and repair procedures
j. Removal and replacement instructions
k. Spare parts and supply list
l. Parts identification
m. Warranty information
n. Testing equipment and special tool information
o. Contractor information

Data Package 4

a. Safety precautions
b. Operator pre start
c. Startup, shutdown, and post shutdown procedures
d. Normal operations
e. Emergency operations
f. Operator service requirements
g. Environmental conditions
h. Lubrication data
i. Preventive maintenance plan and schedule
j. Troubleshooting guides and diagnostic techniques
k. Wiring diagrams and control diagrams
l. Maintenance and repair procedures
m. Removal and replacement instructions
n. Spare parts and supply list
o. Corrective maintenance man-hours
p. Parts identification
q. Warranty information
r. Personnel training requirements
s. Testing equipment and special tool information
t. Contractor information

Data Package 5

a. Safety precautions
b. Operator pre start
c. Start-up, shutdown, and post shutdown procedures
d. Normal operations
e. Environmental conditions
f. Preventive maintenance plan and schedule
g. Troubleshooting guides and diagnostic techniques
h. Wiring and control diagrams
i. Maintenance and repair procedures
j. Spare parts and supply list
k. Testing equipments and special tools
l. Warranty information
m. Contractor information